



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,559	09/22/2003	Ralf Zuber	13441 US	2910
23719	7590	08/22/2008	EXAMINER	
KALOW & SPRINGUT LLP 488 MADISON AVENUE 19TH FLOOR NEW YORK, NY 10022			O'NEILL, KARIE AMBER	
			ART UNIT	PAPER NUMBER
			1795	
			MAIL DATE	DELIVERY MODE
			08/22/2008 PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/668,559

Applicant(s)

ZUBER ET AL.

Examiner

Karie O'Neill

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
4a) Of the above claim(s) 7-12 and 14 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-6 and 13 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

1. Applicant's amendment filed on May 27, 2008, was received. Claim 5 has been amended. Claims 7-12 and 14 have been withdrawn from consideration as being drawn to non-elected claims. Therefore, Claims 1-6 and 13 are pending in this office action.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on November 26, 2007.

Examiner's Note

3. The status identifier of Claims 7-12 and 14 should read "Withdrawn from Consideration". Please make appropriate corrections.

Claim Rejections - 35 USC § 102

4. The rejection of Claims 1-3, 5-6 and 13 under 35 U.S.C. 102(b) as being anticipated by Steck (EP 0586461 B1), is maintained. The rejection is repeated below for convenience.

Claims 1-3, 5-6 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Steck (EP 0586461 B1)

With regard to Claims 1 and 13, Steck discloses a catalyst-coated membrane, for use in a solid polymer electrolyte fuel cell, comprised of:

(a) an ionomer membrane (16), wherein said ionomer membrane comprises two surfaces (page 2 lines 13-15) and each of said two surfaces is comprised of:

(i) an active area (18, 20), wherein said active area is coated with a catalyst layer on an anode and a cathode (page 2 lines 16-19), and

(ii) a passive area which extends beyond the electrochemically active region (page 2 lines 27-30); and

(b) at least one layer of protective film, or a gasket (12, 14), attached to each of the two surfaces of said catalyst-coated membrane (16) (page 4 lines 45-46), wherein said at least one layer of protective film overlaps the passive area and the active area (See Figures 1 and 2 and page 5 lines 25-28).

With regard to Claim 2, Steck discloses in Figure 4, wherein the passive area (16b) forms a perimeter around said active area (18, 20) (page 3 lines 52-57 and page 5 lines 29-36).

With regard to Claim 3, Steck discloses wherein 86% of the membrane is utilized as a cation exchange site with catalyst coating, and the region of the passive area that is overlapped by the protective layer is about 100%, as can be seen in any of Figures 3-6 wherein the active area is that which is covered by the catalyzed electrode (18, 20) (page 6 lines 11-15).

With regard to Claim 5, Steck discloses wherein the organic polymer material comprises a non-hydrophilic thermoplastic elastomeric material (page 3 line 36), including a butadiene/styrene copolymer and ethylene/propylene copolymer (page 5 lines 12-15).

With regard to Claim 6, Steck discloses wherein the ionomer membrane comprises a substance selected from the group consisting of a solid polymer ion exchange membrane, typically a porous, sulfonated material (page 3 lines 35-36).

Claim Rejections - 35 USC § 103

5. The rejection of Claim 4 under 35 U.S.C. 103(a) as being unpatentable over Steck (EP 0586461 B1), as applied to Claims 1-3, 5-6 and 13 above, and in further view of Spencer (WO 00/10216), is maintained. The rejection is repeated below for convenience.

Steck discloses the catalyst-coated membrane in paragraph 5 above, but does not disclose wherein at least one layer of protective film comprises an organic polymer material with a thickness in the range of 10 to 150 microns.

Spencer discloses a catalyst coated membrane for use in a PEM fuel cell stack, the membrane being a porous fluoropolymer, such as stretched porous PTFE and ionomer resins with recurring units of $\text{-SO}_3\text{H}$ or =COOH (page 9 lines 7-9), the periphery of the membrane being overlapped with a protective layer, or gasket, made of an organic polymer material, such as elastomeric polymers, specifically polymeric structures made from PTFE (see Example 4), PVDF, PE, PP, etc. (page 11 lines 11-13). Spencer also discloses, in Example 4, wherein the protective layer, or gasket, has a thickness of 5 mils, which is equal to 127 microns (page 13). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use an organic polymer protective layer with a thickness in the range of 10 to 150 microns with

the catalyst-coated membrane of Steck, because Spencer teaches providing a fluid tight seal between the MEA and gas diffusion layer and to minimize the quantity of the more expensive ionomer composite and electrocatalytic materials that would otherwise be used in the gasketing material (page 6 lines 6-10).

Response to Arguments

6. Applicant's arguments filed May 27, 2008 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

(a) Pursuant to the restriction requirement filed August 8, 2007, Applicant asserts "after examining the restriction in more detail Applicants believe the separation of claims 1 and 9 (and their associated dependent claims) is incorrect. Independent claim 1 is directed to a catalyst-coated membrane (CCM) whereas claim 9 is directed to a membrane-electrode assembly (MEA) containing the CCM and at least one gas diffusion layer (GDL). Accordingly, claims 1 and 9 are related as "intermediate" and "final product"". Applicants respectfully request that the restriction requirement be reconsidered and that independent claim 9 (and its dependent claims 10 and 14) be examined in the present application in conjunction with claims 1-6 and 13.

(b) Applicant asserts, "Steck does not disclose the presently claimed invention, but rather discloses a different type of MEA technology based on the use of gas diffusion electrodes (or catalyst-coated GDLs) in combination with

non-coated ionomer membranes. In contrast, the present application is directed towards catalyst-coated membranes (CCMs), in which the membrane is coated with catalyst layers on both sides. This CCM is optionally combined with GDLs to form a five-layer MEA. Steck does not disclose catalyst-coated membranes".

(c) Applicant asserts that the protective film (equivalent to the "gasketing material" of Steck) is applied in a substantially different way than the present invention. In Steck, the gasketing material is "interposed" between the anode/cathode electrodes and the membrane (see claim 1 and Figures 1 and 2 in Steck) -- thus, resulting in the following layer sequence in the overlapping area: GDL/catalyst layer-gasketing material- membrane. In contrast, the present invention, as set forth in claim 1, requires that the protective film be applied in such a way so that the layer sequence in the overlapping area is: gasketing material (i.e. protective film)-catalyst layer-membrane. Because the layer sequence of the presently claimed invention is different than that of Steck, the CCM structures of the present invention are different than the structures disclosed in Steck.

(d) Due to the different construction, the CCMs (claims 1-6) disclosed in the present application possess superior characteristics compared to the state of the art materials, such as those disclosed in Steck. The present invention results in an MEA having sufficient overlap of the protective film and the passive and active areas of the membrane. The embodiments of the prior art, however, fail to teach

that the protective film (or gasket or subgasket) should overlap the passive area and the active area of the ionomer membrane.

In response to Applicant's arguments, please consider the following comments:

(a) In the Response to the Election Restriction dated September 7, 2007, Applicant elected Group I, Claims 1-6 and 13 to be examined, without traverse. The original restriction requirement deemed that Inventions III and I were distinct and related as combination and subcombination. This restriction requirement of combination and subcombination is appropriate. In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the catalyst coated membrane of Invention I is not required in order to show novelty of the membrane electrode assembly of Invention III. Specifically, Invention III does not require at least one layer of protective film to be "attached to each of the two surfaces of said catalyst-coated membrane", as is required by Invention I. The subcombination has separate utility such as a catalyst-coated membrane for water filtration (see US Pre Grant Publication 2006/0175256). Therefore, after reconsideration, the Examiner notes that the original restriction requirement is appropriate and the originally elected claims (Group I, claims 1-6 and 13) will remain as those pending in this office action.

(b) Steck discloses a five-layer gasketed membrane electrode assembly (page 4 lines 47). Steck discloses an ion exchange membrane interposed between an anode and a cathode which contain a catalytically active material. After consolidation into a single MEA unit (Figure 2), the catalytically active

material adheres to the ion exchange membrane, forming a coating of catalyst material on the ion exchange membrane. Therefore, the ion exchange membrane is a catalyst-coated membrane.

(c) The claims of the instant invention are drawn to a product. The method of application of the protective film, or gasketing material in Steck, is not claimed, therefore, method steps are not given patentable weight. The claims have been given patentable weight with regard to structure. However, it can be seen in Figures 1 and 2 of Steck, that at least one layer of protective film (12, 14) is attached to the two surfaces of the catalyst coated membrane (the membrane being coated with catalyst after consolidation of the layers into a single MEA unit), wherein said at least one layer of protective film (12, 14) overlaps the passive area (which is primarily the surface of the ion exchange membrane) and the active area (which is the catalyst coated surface of the anode (18) or cathode (20)).

(d) In Figures 1 and 2 of Steck, that at least one layer of protective film (12, 14) is attached to the two surfaces of the catalyst coated membrane (the membrane being coated with catalyst after consolidation of the layers into a single MEA unit), wherein said at least one layer of protective film (12, 14) overlaps the passive area (which is primarily the surface of the ion exchange membrane) and the active area (which is the catalyst coated surface of the anode (18) or cathode (20)). Therefore, the advantages mentioned by Applicant in the specification would also apply to the catalyst-coated membrane of Steck.

Conclusion

7. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Karie O'Neill
Examiner
Art Unit 1795

KAO

/Mark Ruthkosky/

Primary Examiner, Art Unit 1795